

# Stossel Creek Planting Trial

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Rowan Braybrook, NNRG

Case study details: [nnerg.org/climateadaptation](https://nnerg.org/climateadaptation)



**NORTHWEST  
NATURAL  
RESOURCE  
GROUP**



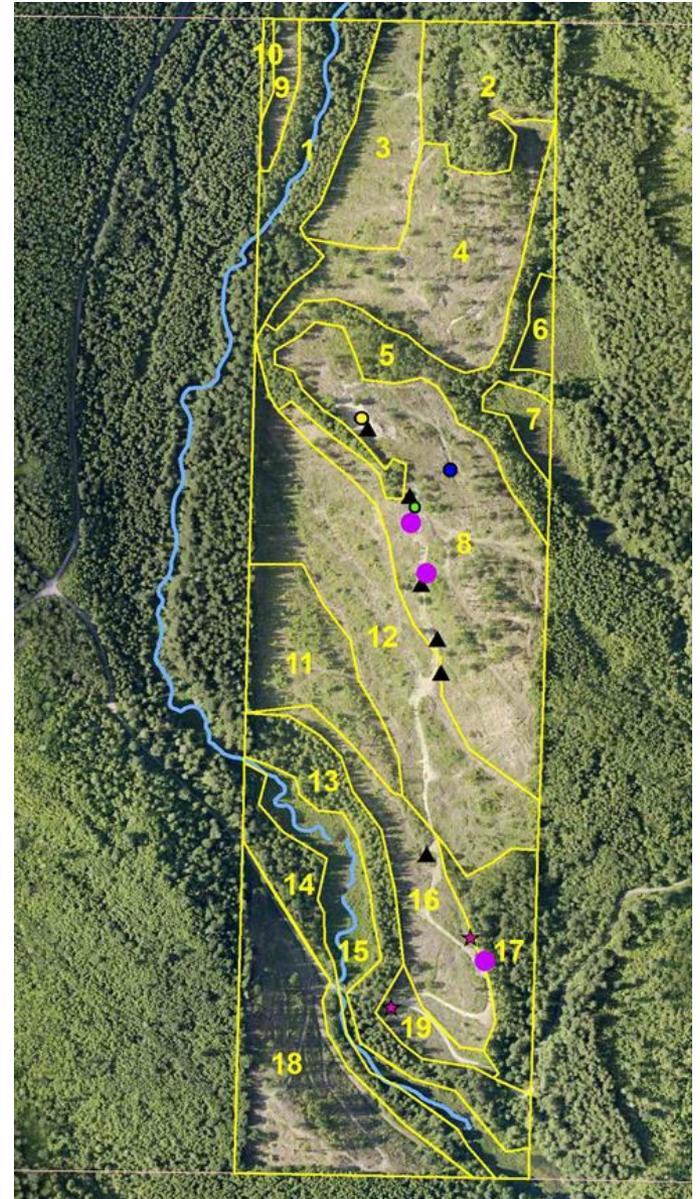
**Seattle  
City Light**



**Seattle  
Public  
Utilities**

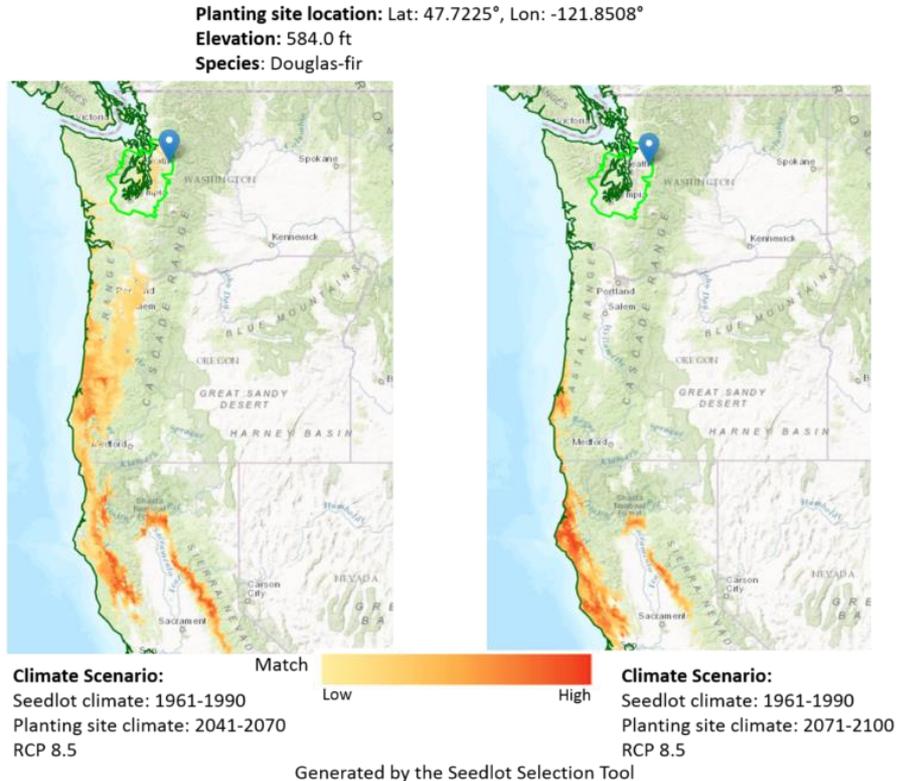
# The Site

- 154 acres near Duvall, purchased by Seattle City Light in 2015.
- Being reforested and restored for salmon habitat.
- Climate-adapted seedlings are being interplanted with naturally regenerated seedlings across the site.
- Trial plots are assessing seven different species and WRC/DF seedlings from different sources.

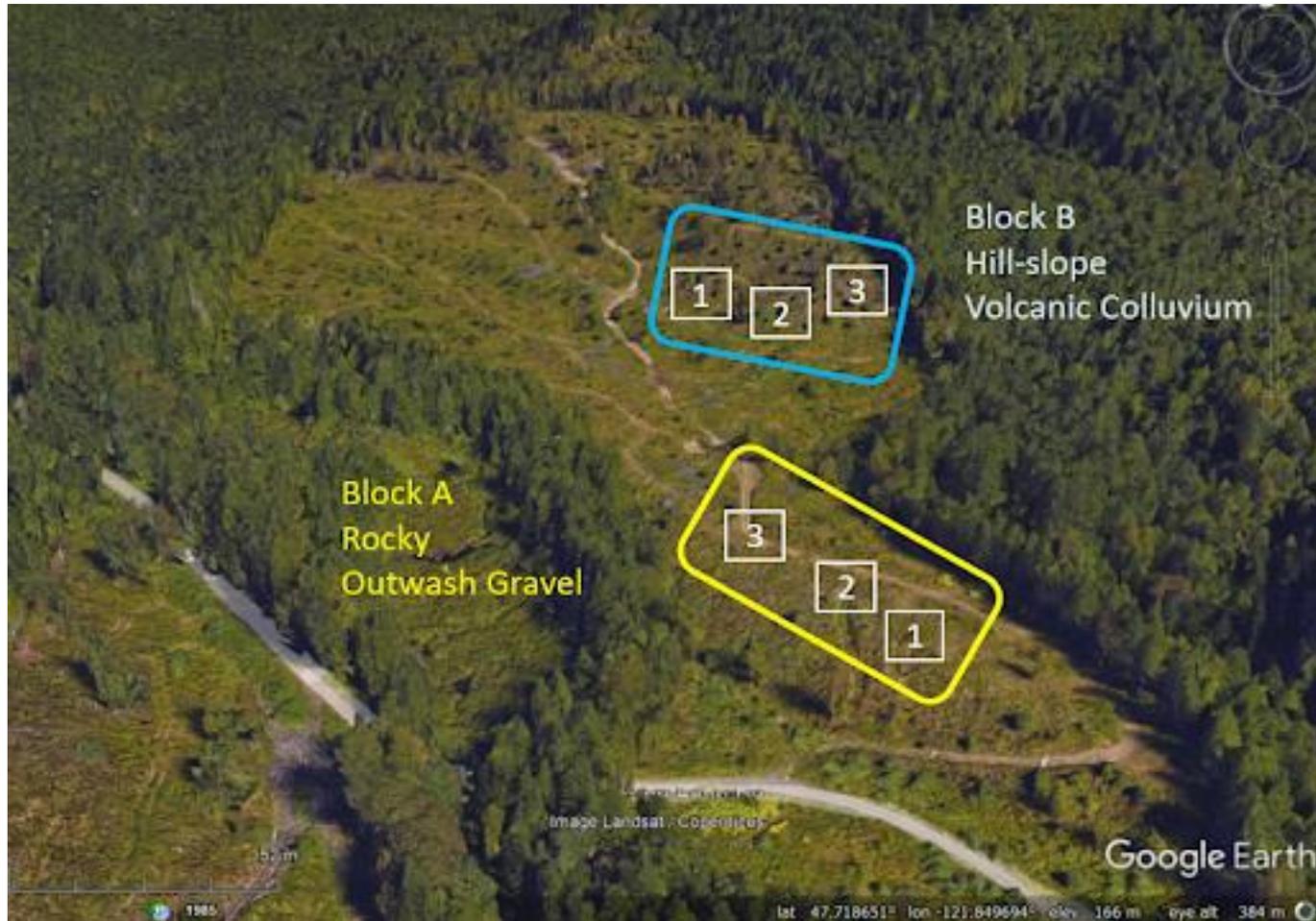


# Seedlot Selection Tool

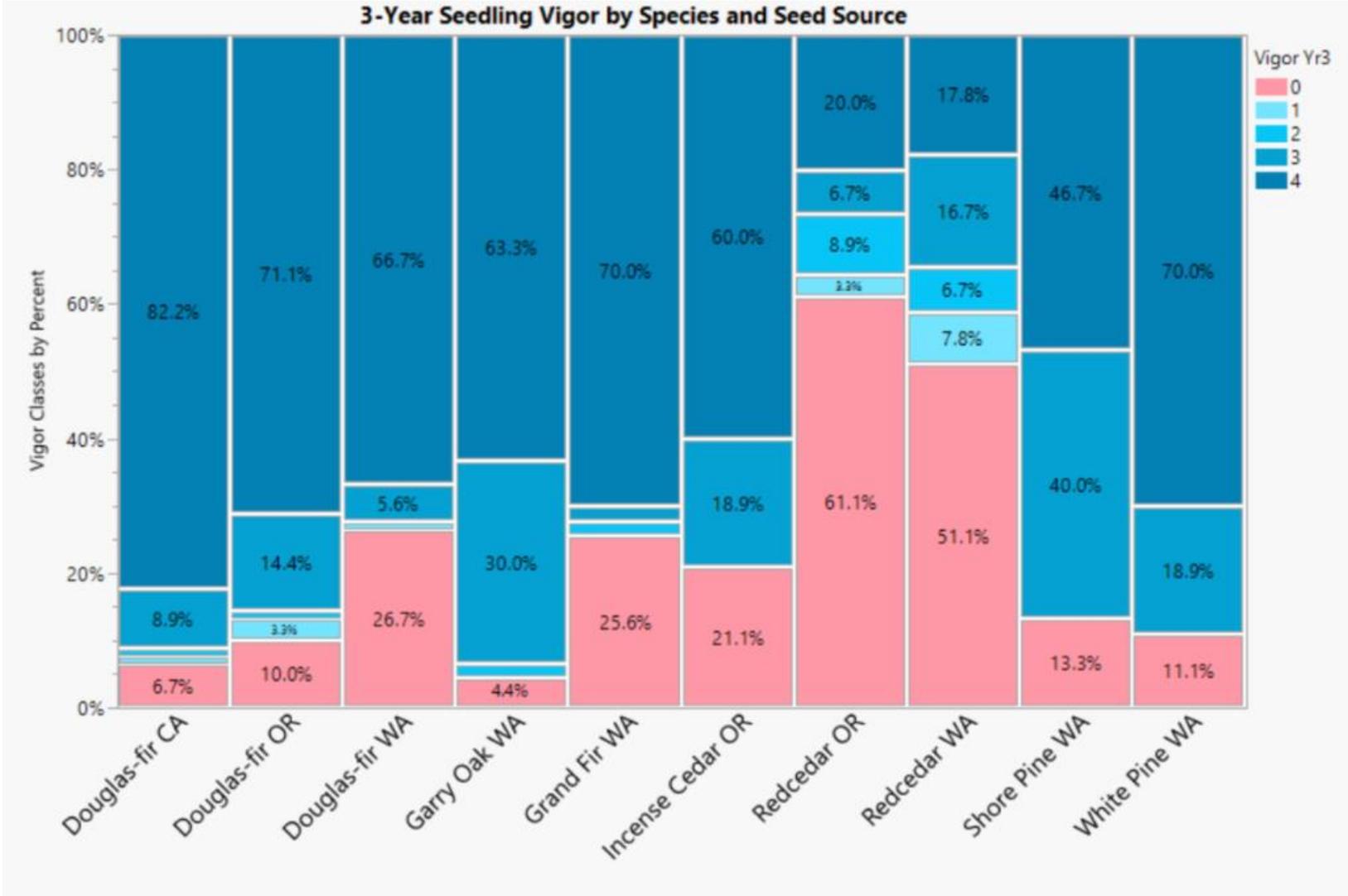
- To ID a climate match, project managers sorted seedlots by:
  - the average temperature of the coldest month (chilling requirements for Doug fir),
  - growing season heat-moisture index, and
  - time range for the mid to end of century.



# Study Design – Trial Plots



Graph of 3-year vigor by species (blue=good)



# Lessons & Recommendations For Similar Projects

1. **Partners have heard few concerns** on the concept of assisted migration, but a cautious approach and clear communications are still needed.
2. **Removal of invasive species** may lead to additional costs.
3. **Availability of selected species** and seed sources can be challenging; managers may need to contract with a nursery to grow from seed.
4. **You may need to order material 2-3 years in advance** if a planting project is selecting specific species and seed zones.
5. **Contracting of any kind** (e.g., cultural surveys) can take time to put in place, so start the process as soon as possible.
6. **Monitoring is an added cost and a long-term commitment** to evaluate survival in the short-term and resilience in the long-term.
7. **Concerns remain on how well the adapted trees will survive cold snaps**, which will occur even as the average temperatures increase.

# Thank you!

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More info: [nnrg.org/climateadaptation](http://nnrg.org/climateadaptation)

# Considerations for Selecting Tree Species

- Replanting local dry-site adapted species, including western white pine, grand fir, Oregon white oak, and shore pine,
- Within-species assisted migration of Douglas-fir and western redcedar genotypes from warmer and drier areas, in addition to WA,
- Range expansion of incense cedar from a southern Oregon seed source, to augment species diversity.

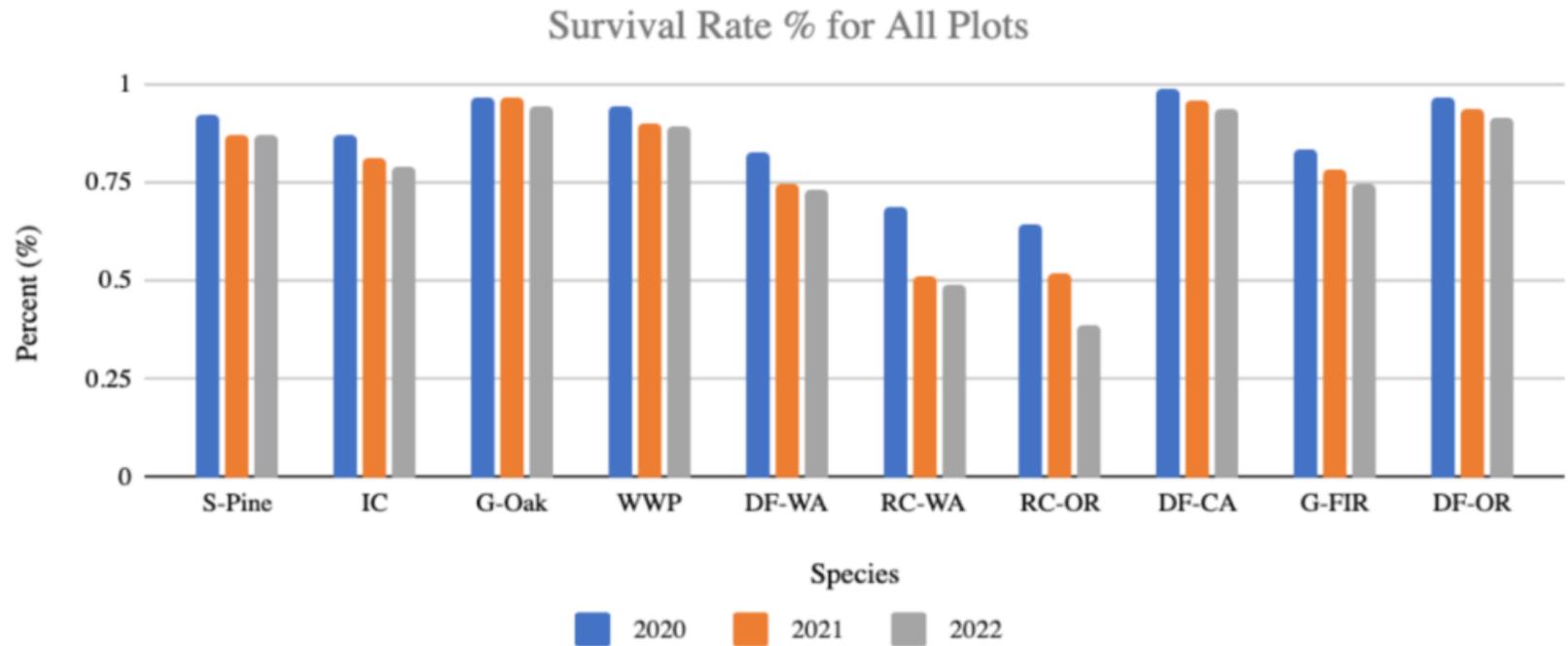
Tree Species	Seedling Range	Nursery Location	Quantity Planted	Size Option/Container	Seedling Costs	Shipping Costs
Douglas-fir	CA seed zone 092	Etna, CA	750	Plug +1	\$800	\$80
Douglas-fir	OR seed zone 051 (Tillamook, OR)	Roy, WA	1000	Plug +1	\$524	pick up
Douglas-fir	WA seed zone 412	Bow, WA	750	6-12"	\$355	N/A
Oregon White Oak	Puget Lowlands	Bellingham, WA	1500	18"-36" bareroot	\$1,350	\$165
Grand Fir	WA seed zone 221	Bow, WA	2188	12" plus	\$824	N/A
Incense Cedar	OR seed zone 270 (2000' elevation)	Salem, OR	1100	3" band pots w/ 1/4" caliper (9" plus height)	\$1,705	\$300
Shore Pine	WA seed zone 221	Bow, WA	1350	12" plus	\$537	N/A
Western Redcedar	OR seed zone 251 ( <del>Willamina</del> , OR)	Roy, WA	960	Plug +1	\$524	pick up
Western Redcedar	WA seed zone 412	Bow, WA	1072	12" plus	\$709	\$450
Western White Pine	Whidbey Island Orchard	Roy, WA	2535	Plug +1 (600) and <del>Styro</del> 8's (2500)	\$963	pick up
Western White Pine	Moscow, Idaho	Bow, WA	925	12" plus	\$638	
<b>Totals</b>			<b>14,130</b>		<b>\$8,929</b>	<b>\$995</b>

# Trial Plot Layout Example

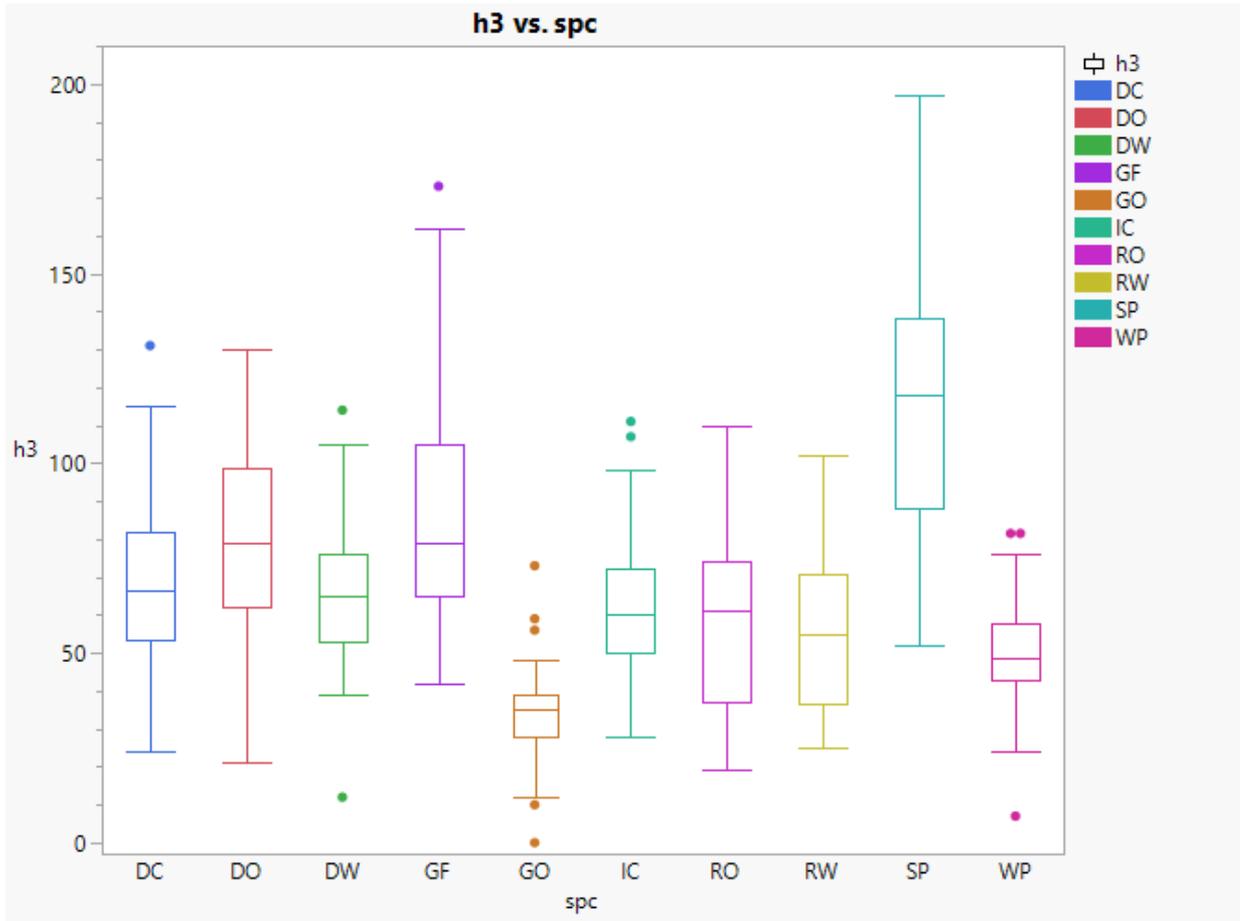
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
<b>Block 1</b>	<b>Rep 3 Site 16</b>										<b>North</b>					<b>→</b>	
<b>Species</b>	<b>Seedling#</b>																
DF-WA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	East	
GOak	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
DF-CA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
IC	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
RC-WA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	↓	
Wpine	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
GFir	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
SPine	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
DF-OR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
RC-OR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		



# Initial Results (After 3 Years)



# Box plot of 3-year height by species



Box plot of 3-year height GROWTH by species, seedlings with 3-year growth <0 were excluded

